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Development and Validation of the Short-Form Employability Five-Factor Instrument

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Abstract

A 22-item short-form of the 47-item Employability Five-Factor instrument (Van der Heijde & Van der Heijden, 2006; Van der Heijden, De Lange, Demerouti, & Van der Heijde, 2009) was developed and validated across five empirical survey studies. The Short-Form Employability instrument has consistent and acceptable internal consistencies and a similar factor structure across all samples studied. The outcomes favor a five-dimensional operationalization of the employability construct over a one-dimensional higher-order construct, with good discriminant validity of the underlying employability dimensions. Moreover, since the five dimensions of employability all appeared to be significantly related to both objective and subjective career success outcome measures, the predictive validity of the shortened tool is promising. The Short-Form Employability instrument facilitates further scientific HRM and career research without compromising its psychometric qualities.

Keywords: Employability; Multi-Dimensional Operationalization; Scale Development; Short-Form Instrument

Introduction

Nowadays, organizations need to be more and more flexible to remain competitive (Collet, Hine, & Du Plessis, 2015; Lazarova & Taylor, 2009; Van der Heijden & Bakker, 2011). This has important implications for employees' expertise requirements. Specifically, the potential of a working organization to perform optimally and to remain competitive (Crook, Todd, Combs, Woehr, & Ketchen, 2011) depends on employees' capabilities to develop, cultivate and maintain fundamental qualifications (Brown, Green, & Lauder 2001), or otherwise stated, to enhance their employability (Forrier & Sels, 2003; Fugate, Kinicki, & Ashforth, 2004; Hillage & Pollard, 1998; Rothwell & Arnold, 2007; Van der Heijde & Van der Heijden, 2006).

Over the past decennia, policy-makers, scholars and practitioners alike have given considerable theoretical thought to the conceptualization of employability. This has resulted in a rich variety of interpretations and measures across different disciplines, such as career research, education, management and psychology (Forrier & Sels, 2003). In this contribution, we particularly aim to elaborate on the psychological notion of employability by interpreting employability as the subjective perception held by an employee (or by his or her supervisor) about his or her possibilities, in terms of competences, to obtain and maintain work (see also Berntson & Marklund, 2007).

An historical analysis shows that the area of concern in employability research has changed over time (McQuaid & Lindsay, 2005). It originated in the post-war era at the macro-level, where it targeted, in response to the demand for labor, at activating disabled and disadvantaged labor market groups. In the 1980s, employability was approached at the meso-level, where organizations targeted at increasing employees' intra-organizational flexibility in order to enhance competitive advantage. Only recently, in line with the notion of individual agency (Van der Heijden & De Vos, 2015), the micro-level of the individual has become the core of attention in employability research (see Vanhercke, De Cuyper, Peeters, & De Witte,

2014 for more in-depth information on the historical outline).At the micro-level, a distinction can be made between a so-called input-based and output-based approach of employability (Vanhercke et al., 2014). When adopting an input-based approach, scholars focus on knowledge, skills and attitudes, or more general, competencies to assess employability (Fugate et al., 2004; Peeters, Nelissen, De Cuyper, Forrier, Verbruggen, & De Witte, 2017; Van der Heijde & Van der Heijden, 2006). When adopting an output-based approach, scholars focus on indicators of employability, such as individual employees' perceptions of their opportunities for obtaining or retaining a job and for achieving a new labor market position or making a transition across labor market positions (Vanhercke et al., 2014).

This contribution builds upon an input-based approach of employability (i.e., knowledge, skills and attitudes, or more general, competencies). The advantage of an input-based or competence-based measurement approach, compared to more output-oriented ones, is that it measures individuals' career potential and enables scholars to disentangle the importance of the different components to get more insight into their interrelatedness, and to examine how employees may make progress in their employability enhancement (cf. Van der Heijde & Van der Heijden, 2006). Specifically, for Van der Heijde and Van der Heijden (2006), employability refers to an individual's capacities that enable his or her potential for permanent acquisition and fulfillment of employment, within or outside one's current organization, for one's present or new customer(s), and with regard to future prospects (p. 453). Their five-dimensional operationalization combines domain-specific *occupational expertise* (knowledge and skills, including meta-cognitive ones, and social recognition by important key stakeholders; Van der Heijden, 2000) with four competences that are generic: *anticipation and optimization*, *personal flexibility*, *corporate sense*, and *balance*. The second and the third dimensions are flexibility dimensions, discernible as one more proactive/creative variant and one passive/reactive variant. Corporate sense captures the more social competences that can be exerted within an

organization. Balance takes into account the different elements of employability that are sometimes hard to unite and which require fine-tuning, such as current job versus career goals, employers' versus employees' interests, and employees' opposing work, career, and private interests.

Over the past decades, substantial changes have taken place in the world of work that call for reconsidering the notion of careers, stressing the need for 'sustainable careers' (Van der Heijden & De Vos, 2015). In so-called 'new careers,' the promise of employment security has been replaced with the notion of employability (e.g., Fugate & Kinicki, 2008; Hallier, 2009; Inkson & King, 2010). Nowadays, employability is the key factor for workers who need to protect their added value in the modern career era that is characterized by fast changing (labor) market developments, demographic changes, such as aging and dejuvenization of the labor market, an increased retirement age in many Western countries, new production concepts, new technology, and increased commercialization, to mention but a few. New careers imply self-steering, self-development, flexibility, proactivity and a continuous broadening of expertise of employees throughout their working life (e.g., Van der Heijde, 2014), all aimed at making them less vulnerable in instable, unpredictable and complex labor markets.

The psychometrically valid and reliable multi-dimensional competence-based instrument of Van der Heijde and Van der Heijden (2006) comprises a conceptualization that goes into detail about what competences workers should develop to be able to fulfill a valuable and long-lasting contribution to work and organizational outcomes. It is based upon the idea that some characteristics of expert performance and of employability are valid regardless of the specific professional domain (i.e., domain-independent). The instrument has shown convergent and divergent validity (see Van der Heijde & Van der Heijden, 2006, p. 468). The advantage of a competence-based measurement approach is that it measures potential that has already been

converted (or that may be converted) into action (see Van der Heijde & Van der Heijden, 2006, p. 452-453).

The objective of this article is to present a psychometrically sound, but shortened measure for the Employability Five-Factor construct. The intended measure potentially facilitates researchers in the field of Human Resource Management (HRM) and careers who investigate determinants and risks of employability enhancement and its impact upon individual and organizational outcomes. Moreover, it has practical value both for the human resource management function of supervisors (e.g., for assessing their subordinates) and for employees themselves (e.g., in providing suggestions for developing their careers).

With the increasing interest in employability in both scientific and applied research, we anticipate a growing need for a short-form employability measure. A consequence of research funding frameworks encouraging networks of scholars from different disciplines to collaborate may be that the latter strive to incorporate a wider range of variables in their studies. To meet practical limitations on available time and resources, scholars increasingly resort to short-form measures to increase efficiency of testing (Stanton, Sinar, Balzer, & Smith, 2002). Moreover, studies that require respondents to rate themselves and/or other actors on several occasions, so-called longitudinal or multi-wave designs, may also profit from the use of short-form measures. In addition, longer surveys might increase the chance that respondents will respond carelessly due to frustration with the length of the assessment (e.g., Schmidt, Le, & Ilies, 2003). Consequently, respondents may not complete the full list of items or may drop out from follow-up data collections.

It is of utmost importance to conscientiously test the psychometric qualities, that is, the validity and reliability, of short-form instruments to evaluate whether they have comparable outcomes with the parent (original) measures and to investigate their generalizability across independent samples (see Marsh, Ellis, Parada, Richards, & Heubeck, 2005). In conclusion, the

development and validation of a short-form measurement instrument for the five-factor employability construct is important for scientific progress.

Towards a Short-Form Instrument for the Employability Five-Factor Construct

Kruyen, Emons and Sijtsma (2013) reviewed hundreds of abbreviated measurement instruments. They stressed to carefully address the impact of using so-called short-form instruments on reliability and validity issues and came up with procedural recommendations. They warned against only focusing blindly on minimum thresholds of reliability. The authors argued that researchers tend to report reliability more as a ritual and, by default, consider a modest reliability of between .70 and .80, high enough. Therefore, they readily accept losing half of the items for reasons of practical efficiency (p. 244), especially when relying on statistics-driven methods alone in striving for item reduction.

Furthermore, items correlating highly with one another often have more similar content in comparison with items having lower inter-correlations. This tends to narrow construct coverage and construct validity (e.g., Reise & Waller, 2009). Construct-related validity entails the degree to which a test measures the construct of interest and is commonly investigated by means of factor analysis that allows assessing the internal structure of a test. Again, a particular pitfall when using statistics-driven strategies alone and relying only on statistical fit measures is its 'blindness' for protecting item content. In a traditional factor-analytic approach, this may result in selecting items with strong similarities regarding content, which in turn leads to an unintentionally narrowed content domain (Clark & Watson, 1995; Stanton et al., 2002).

Kruyen et al. (2013) speculated that many researchers are unaware of the fact that measurement precision might significantly decrease when a shortened test is used, also when the reliability is not that much affected (see also Sijtsma & Emons, 2011). Furthermore, they noted that both construct and predictive validity are not often ascertained. Predictive validity

refers to the degree to which shortened test scores accurately predict a certain criterion. This may be assessed by the correlation between the specific measure and one or several criterion variables. One may expect this correlation to be lower for a short-form measure than for the original one as the removal of items is often associated with a lower test-score reliability, which enlarges the influence of random measurement error (Allen & Yen, 1979, p. 98). However, if developing short-form versions of measurement instruments leads to construct misinterpretation, the test-criterion correlation for the newly developed measure is difficult to interpret (Kruyen et al., 2013).

To conclude, evidence for the validity of the original version of a measurement instrument does not automatically imply that this also holds true for its short-form version (Smith, McCarthy, & Anderson, 2000). In other words, scholars need to carefully demonstrate the validity of the short-form version as well, also in case the longer version had adequate validity. Although a combination of strategies, such as judgmental and statistics-driven strategies, is likely to result in higher reliability and validity, only few empirical studies aimed at shortening instruments followed such an approach. Similarly, only few studies collected new data and tested the properties of the short-form measure using (a) new sample(s), even although this is a highly recommended strategy (Kruyen et al., 2013).

This empirical work aimed to comply with the challenges put forward by Kruyen and colleagues (2013) combining a judgmental strategy with a statistics-driven one. Specifically, given the concern for measurement precision, when constructing our short-form instrument scales for the five-factor employability construct, and the need to investigate its predictive validity, we validated the short-form instrument in both existing and new samples. In all of these samples, we determined the sub-scales' reliability and we assessed the instrument's construct validity using a confirmatory factor-analytic approach. In line with Kruyen et al. (2013), we started the reduction of the sub-scales before testing the short-form instrument scales

using a new sample of respondents. After all, in 'sensu stricto,' for several reasons, such as response biases and capitalization on chance, previous samples cannot be used to assess a short-form instrument's validity [see Kruyen et al. (2013) for an extensive overview].

Method

Procedure and Samples

In this study, we used five separate samples to validate the Short-Form Instrument. Data set A was used for the initial development of the short-form measure. Data set B was used to perform our initial analysis and to adjust the sub-scales before administering them to a new sample of respondents (i.e., Data set C). For the investigation of content validity, we compared the original scales and the shortened scales using two previously collected samples (Data sets D and E). More specifically, in the development phase, a test sample (Data set A) and a re-test sample (Data set B) were employed. Data set C comprised a new sample of respondents that was used to test the reliability and validity of the short-form instrument. Data sets D and E encompassed earlier collected data that were used for sake of comparing the original versions of the measurement scales with their short-form versions.

(Table 1 about here)

Table 1 provides an overview of all samples' characteristics. Data set A was collected by means of an e-questionnaire among workers registered at a Dutch work agency for virtual work in the business service sector. This data set comprised information on a wide variety of issues related to labor market participation, working conditions, employability, and work outcomes, such as well-being and health. All persons registered at the virtual work agency's data base (N = 7,700)

were initially approached by e-mail with a reference to the work agency's permission and research goals. After having sent three reminders, 583 registered persons had filled out the e-questionnaire (response rate was 7.6%). The respondents operated in various sectors, most often in 'business services' (35.2%), 'health care and well-being' (18.3%), 'public governance' (12.1%), and 'science and education' (7.7%). 89.0% of the respondents were female. The respondents' average age was 46.36 (SD = 8.60). 79.4% were living together, either cohabiting or being married; 62.1% had children to take care of. 75.8% worked part-time. The average tenure in the organization was 12.16 (SD = 8.79).

Data set B was gathered by means of an electronic survey submitted to employees of a Dutch university (Van der Heijden, Van der Klink, & Meijs, 2006). The purpose of this survey was to gain more insight into employees' perceptions of their own employability. 710 employees were contacted and asked for participation. Of the contacted employees, 49.9% (N = 354) filled out the questionnaire. As regards job category, 13.6% of the respondents worked in 'administration and secretarial support,' 2.5% in 'facilities,' 9.9% in 'ICT,' 8.2% in 'management and management support,' 2.3% in 'personnel and organization,' 3.4% in 'Public Relations,' 9.0% in 'student support,' 6.2% in 'education and research support,' 39.9% in 'education and research' (the so-called academic job categories), and 39.3% in 'other job categories.' 51.1% of the respondents were male. The respondents' average age was 46.24 (SD = 9.20). Almost 80% were married or co-habiting; 42.4% had children to take care of. 42.1% of the respondents worked part-time. The average tenure in the organization was 10.43 years (SD = 5.71).

Data set C that was gathered to test the reliability and validity of the short-form instrument was collected with the help of master students that participated in the strategic HRM educational program offered at another Dutch university. This data set comprised a rather heterogeneous sample that was collected in 37 different organizations and across different

occupational sectors (N = 414; response rate 66.9%). 61.2% of the respondents were female. The respondents' average age was 37.70 (SD = 13.15). 65.5% of the respondents had a permanent contract. 60.4% of the respondents worked part-time. The average tenure in the organization was 9.49 years (SD = 9.70) and 19.5% assumed a supervisory position.

Data set D included employees working in Small and Medium-sized Enterprises (SMES, i.e., commercial organizations employing fewer than 250 people using the European Union definition) in a southern province in the Netherlands (Stoffers, Van der Heijden, & Notelaers, 2014). Companies were identified using existing personal contacts. When considering a certain enterprise, the researchers aimed to include different types of industries. The resulting data set comprised 487 employees working in 151 SMEs. To ensure respondents' anonymity and to mitigate social desirability, an independent agency was used to administer a web questionnaire. Each employee received an anonymous response report containing his or her scores, interpretation guidelines, and a clear framework demonstrating ways to improve one's employability. 59.5% of the respondents were male. The respondents' average age was 38.00 (SD = 11.05). 67.5% were married or co-habiting. 41.9% had children to take care of. The average tenure in the organization was 7.43 years (SD = 5.51).

Data set E was gathered among employees with at least middle-level positions working in a large Dutch firm that produces building materials (Van der Heijde & Van der Heijden, 2006). The respondents were informed about the background of the study and were asked to complete an e-questionnaire using the company's Intranet. To ensure respondents' anonymity and to prevent social desirability in answering, the website was fully administered by an independent expert agency that was under one of the researchers' supervision. This final sample consisted of 314 employees working in numerous job categories at middle- and higher-level positions (response rate was 91.8%). 83.3% of the respondents were male. The respondents'

average age was 40.94 (SD = 9.20). 84.8% of them were married or cohabiting. 49.5% had children to take care of. The average tenure in the organization was 10.52 years (SD = 9.61).

Measures

Employability was assessed with Van der Heijde and Van der Heijden's (2006) measurement instrument which has proven to have sound psychometric qualities (see also Van der Heijden & Bakker, 2011; Van der Heijden, De Lange, Demerouti, & Van der Heijde, 2009). The full instrument includes five sub-scales measuring: occupational expertise (15 items); anticipation and optimization (8 items); personal flexibility (8 items); corporate sense (7 items); and balance (9 items) (see Van der Heijde & Van der Heijden, 2006 for the full item list and see Appendix 1 for the short-form final measurement instrument). The item sets were all scored on a six-point rating scale. Example items were: "I consider myself … competent to weigh up and reason out the 'pros' and 'cons' of particular decisions of working methods, materials, and techniques in my job domain" (*occupational expertise*) (answering categories ranging from "not at all" to "extremely" and Cronbach's alpha (α) ranging from .75 to .87 across the different samples; "I consciously devote attention to applying my newly acquired knowledge and skills" (*anticipation and optimization*) (answering categories ranging from "never" to "very often" and α ranging from 70 to .80; "I adapt to developments within my organization ..." (*personal flexibility*) (answering categories ranging from "very badly" to "very well" and α ranging from .74 to .81; "In my organization, I take part in forming a common vision of values and goals" (*corporate sense*) (answering categories ranging from "never" to "very often" and α ranging from .72 to .83; and "The time I spend on my work and career development on the one hand and my personal development and relaxation on the other are … evenly balanced" (*balance*) (answering categories ranging from "not at all" to "to a considerable degree" and α ranging from .63 to .79. Moreover, elaborate tests of the psychometric aspects of the two nominal identical versions of the instrument (self-report and supervisor version) that have been

developed (see Van der Heijde & Van der Heijden, 2006), that is, reliability and validity, testing convergent-, discriminant- and predictive validity (for career success) have yielded very promising results (see Van der Heijde & Van der Heijden, 2006; Van der Heijden et al., 2005).

Next, we will highlight the measures of the criterion variables in the order of the samples presented in this article. In Data set C, two criterion variables were used. Affective commitment was measured using the widely adopted eight-item scale by Allen and Meyer (1990). The respondents had to indicate on a five-point Likert scale to which extent they agreed with the statements (with scale anchors ranging from "totally disagree" to "totally agree"). The two following items had low factor loadings and substantially decreased the psychometric qualities of the measure: "I think that I could easily become as attached to another organization as I am to this one" and "I do not feel a 'strong' sense of belonging to my organization." Therefore, these items were eliminated from further analyses. The remaining six items had sufficient reliability with Cronbach's alpha being .75. Individual performance was measured with the self-assessment scale from Goodman and Svyantek (1999). Example items were: "You achieve the criteria for performance" and "You achieve the goals" (with five scale anchors ranging from "complete disagree" to "completely agree"). Cronbach's alpha was .85.

In Data set D, innovative work behavior was included as the criterion variable. It was measured by using the thoroughly validated scale developed by Janssen (2000). In this nine-item scale, three items referred to idea generation, three to idea promotion, and three to idea realization. To prevent common-method bias, the supervisor ratings were used in our analyses. Examples for the supervisor ratings were: "This worker creates new ideas for improvements" (idea generation; α = .90); "This worker mobilizes support for innovative ideas" (idea promotion; α = .92); and "This worker transforms innovative ideas into useful applications" (idea realization; α = .90). The items were scored using a seven-point rating scale with a response format ranging from "never"' to "always."

Finally, in Data set E, subjective career success was incorporated as the criterion variable. It was measured with Gattiker and Larwood's (1986) instrument, consisting of the following five sub-scales: job satisfaction (8 items, $\alpha = .67$), interpersonal success (4 items, $\alpha = .58$), financial success (3 items, $\alpha = .68$), hierarchical success (4 items, $\alpha = .61$), and life success (4 items, $\alpha = .67$). The first four components comprise organizational success, while the fifth dimension comprises non-organizational success. Examples items were: "I am receiving positive feedback about my performance from all quarters" (job satisfaction); "I am respected by my peers" (interpersonal success); "I am drawing a high income compared to my peers" (financial success); "I am pleased with the promotions I have received so far" (hierarchical success); "I am satisfied with my life overall" (life success). All items were scored using a five-point rating scale with a response format ranging from "disagree completely" to "agree completely."

Analyses

We used list-wise deletion in Mplus. Hence, individuals who had a missing on any one of the indicators were omitted from all further analyses. With respect to kurtosis and skewness, Mplus provides a simple piece of information, that is the scaling factor (Muthén & Muthén, 2013). If the scaling factor to correct the χ^2 is close to 1, the multivariate normality assumption is not violated. The scaling factor to correct for the χ^2 was 1.1682, 1.1620, and 1.0711 for, respectively, Data set C, Data set D, and Data set E.

Following Jöreskog and Sörbom (2001), we first studied the exact fit, that is, the chi-square (χ^2) statistic using Mplus 7.11 (Muthén & Muthén, 2013). As a perfect fit is rarely obtained, Jöreskog and Sörbom advise to use an approximate fit measure. Therefore, we incorporated the RMSEA, (P)RMSEA, CFI and TLI and the SRMR as well. The RMSEA is a measure of the average standardized residual per degree of freedom and values below .08 can be considered as favorable (Browne & Cudeck, 1993). The (P)RMSEA is a one-sided test of

the null hypothesis stating that the RMSEA equals .05, comprising a close-fitting model. If the *p* is greater than .05 (i.e., not statistically significant), it can be concluded that the fit of the model is 'close' (Kenny, 2014). The CFI (Comparative Fit Index) and TLI (Tucker-Lewis Index) are measures of the relative improvement in fit of the hypothesized model compared with the null model and values above .90 can be considered favorable (Hu & Bentler, 1999; Medsker, Williams, & Holahan, 1994). The SRMR is a measure of the average absolute correlation residual and values below .10 are considered to be appropriate (Kline, 2005). Finally, we also used descriptive measures to assess the fit of the specific factor structure. Because of concerns about non-normality which may result in a possible deflation of standard error estimates (Kline, 2005), we used the robust Satorra Bentler χ^2 ML-based estimator in Mplus (Byrne, 2012).

Results

Reliability Analyses

(Table 2 about here)

From Table 2 we can conclude that the reliability of all sub-scales was acceptable with $\alpha \geq .70$, in each and every case (with one exception: the balance sub-scale in Data set E had $\alpha = .63$), and the number of items was rather low (i.e., four or five items for each sub-scale) (Tabachnick & Fidell, 2007).

Analyses and Outcomes of the Development Phase

As previously indicated, in response to the concerns raised by Kruyen et al. (2013), we followed both a judgmental and a statistics-driven strategy for shortening the sub-scales in the

development phase. In particular, we used Structural Equation Modeling (SEM) to assist us with the decision to either delete or include items and construed a team of experts to guide us during this decision process. Whereas SEM is especially useful for investigating multi-dimensional measures, as loadings and cross-loadings can be assessed simultaneously, a critical dialogue among experts within the scholarly fields of both statistics and employability withheld us from blindly following fit indices.

In the development phase, we employed two samples: a test sample (Data set A) and a re-test sample (Data set B). First, using Data set A, five single-factor models, each corresponding to one particular dimension of the employability concept, were tested. To assess the factorial validity of the short-form employability five-factor instrument, we performed confirmatory factor analyses and imposed a second-order factor model capturing the multi-dimensional nature of the employability construct in each of the samples. Both the inspection of factor loadings and modification indices led us to conclude that certain items could be removed. Moreover, the modification indices pointed to an error correlation between items Number 2 and Number 3 for the occupational expertise sub-scale (see the Appendix). For items that were cross-loading or inclined to correlate with items from other factors than the intended one, their specific content was inspected and the effective deletion of items happened in a thorough dialogue between a statistician (one of the authors) and two domain-specific scholars (two of the other authors). If too much overlap was present, the item was removed. As such, in an iterative procedure, we arrived at the short-form one-factor models for the five sub-scales of employability.

In the second step of the development phase, the solution from the first step was re-tested using Data Set B. However, the reliability of the short-form sub-scales appeared not to be sufficiently high in this re-test sample. Therefore, as pruning down seemed to be done too extremely, we decided to revert to the step of item elimination once more. Specifically, for each

dimension of employability, we added one of the original items in consultation with the employability domain-specific scholars (two of the authors). This revised model was subsequently investigated in both the test (Data Set A) and re-test (Data Set B) samples. As portrayed in Table 3, the final solution, with allowing an error correlation between occupational expertise items Number 2 and Number 3, was associated with a satisfactory fit. The last column in Table 3 denotes a statistical test, i.e., χ^2 difference test, to determine whether a second-order structure for the five dimensions of employability fits the data better. The $\Delta\chi^2$ showed that in Data set A such a restriction of the measurement structure was associated with a significant deterioration of fit whereas this appeared not to be the case in Data set B. Next, we assessed measurement precision by calculating the means and standard errors of both parent (original) and short-form sub-scales (see Table 4). The comparison of the means and their standard errors indicated that the outcomes between the original and the short-form employability sub-scales were highly comparable, both within and between the two samples (Data Sets A and B).

(Table 3 about here)

(Table 4 about here)

Analyses and Outcomes of the Test Phase

Table 5 exhibits the fit indices to evaluate the factorial structure (construct validity) of the short-form employability sub-scales. The confirmatory factor model held approximately in both the new (Data Set C) and previously collected samples (Data Sets D and E). In all samples, the

descriptive fit measures CFI and TLI were very close to, or well above, .90 and the SRMR was below .08. Hence, distinguishing five factors fitted sufficiently with the different data sets.

(Table 5 about here)

Imposing a second-order factor model portraying that the five dimensions are indicators of one overarching employability concept reduced the fit in all data sets as the χ^2 increased significantly. Hence, based on the outcomes using our different samples, it is inadequate to impose such a higher-order factor. We note that the factor loadings were all in line with the recommendations. Specifically, no single factor loading was less than .40 (see Table 6).

(Table 6 about here)

With respect to content validity, the Pearson's *r* correlations of the short-form sub-scales with the original sub-scales showed that the short-form sub-scales measured nearly the same latent variables, since all correlations were equal or larger than .90 (see Table 7). The comparison of the means and their standard errors, which are presented in Table 8, yielded hardly any differences between the original and the short-form employability sub-scales within and between the two samples (Data sets D and E). The largest mean difference was .20 (for personal flexibility using Data Set D). However, in most cases the difference between the means was less than .10. Importantly, no pair of standard errors differed more than .006 from one another. Hence, the short-form employability sub-scales have a similar precision as the original ones.

(Table 7 about here)

(Table 8 about here)

Finally, we dealt with the issue of predictive validity by computing the Pearson's *r* correlations between the short-form factors (sub-scales) and the criterion variables across the different samples. To assess the performance of the short-form sub-scales as compared to the original ones, we also calculated the correlations between the original sub-scales and the criterion variables. With our data, the predictive validity of the short-form employability sub-scales upon the distinguished criterion variables could be demonstrated. For all outcome variables, the predictive role of at least three employability dimensions was significant (see Table 9 for all specific outcomes). In some cases, there appeared to be a negative or no association between a certain employability dimension and a certain criterion variable. For instance, in case financial success was the outcome measure, there was no significant relationship with the balance dimension, while the relationship was significantly negative for all other four employability indicators. Moreover, it was found that in the analyses with innovative behavior being the criterion variable, the employability dimensions of occupational expertise and balance did not seem to matter. For the other three employability dimensions, all relationships appeared to be significantly positive.

(Table 9 about here)

Discussion

This cross-validation study used five samples of different sectors to investigate the reliability and validity of a short-form employability instrument (including 22 items instead of the 47-item full version of the instrument; Van der Heijden & Van der Heijden, 2006). Across these samples, construct validity and predictive validity were assessed and the reliability and precision were calculated. Table 10 provides a complete overview of the conducted tests across the different samples. Following Kruyen et al. (2013), we may conclude to have established a valid, reliable and precise short-form employability instrument that fits both homogenous and heterogeneous samples.

(Table 10 about here)

Given the domain-independent character of the parent (original) version of the instrument, we explicitly aimed for a generic short-form version as well. In our cross-validation study, we found enough statistical evidence for a shortened five-scale version of the domain-independent employability measure that can be used in different contexts and sectors.

It is interesting to note that all of the distinguished stages of innovative work behavior (see also Stoffers et al., 2014) were predicted by a combination of three employability dimensions, namely: anticipation and optimization, personal flexibility, and corporate sense. From our data, we may conclude that employees that are scoring high on the capacity to proactively prepare for and to adapt to future changes in a personal and creative manner (anticipation and optimization), and that adapt easily to all kinds of changes in the internal and external labor markets (personal flexibility), are the ones that are likely able to meet the ever-increasing requirements (e.g., Gerken, Messmann, Froehlich, Beausaert, Mulder, & Segers, 2018).

Moreover, given the predictive value of corporate sense, we conclude that one should invest in networking skills and actual participation in different types of working groups, and share responsibilities, expertise, successes *et cetera* (that is, portraying corporate sense) as well in order to be able to portray innovative work behavior and to stay at the forefront of developments in one's field. These outcomes are in line with the findings of Madrid, Patterson, Birdi, Leiva, and Kausel (2014) who stated that anticipating and taking advantage of changes in the workplace is positively related to innovative work behavior, and with Badilescu-Buga (2013) and Hoidn and Kärkkäinen (2014) who reported that employees' application of newly acquired knowledge and skills (anticipation and optimization) relates positively to innovation.

As regards corporate sense, our findings are corroborated by the scholarly work by Radaelli, Lettieri, Mura, and Spiller (2014), and by Ritala, Olander, Michailova, and Husted (2015) who found that sharing experiences and knowledge with colleagues seems essential for creating, promoting, and realizing a sufficient number of new ideas, which may enhance innovation. Occupational expertise and balance, however, appeared not to predict any of the three stages of innovative work behavior. A possible explanation might be that in order to innovate, employees predominantly have to invest in enlarging their competencies to foresee future demands for knowledge and skills and to further develop competencies to adjust flexible to labor market requirements [see also Thijssen and Van der Heijden (2003) on the problem of experience concentration, and Stein (1989) on the notion of functional fixation which might be disadvantageous in the light of innovative power]. The individual employee's domain-related knowledge and skills (occupational expertise) and his or her ability to balance conflicting goals, both as regards to their current job versus their career, and work-related versus private interests, and reaching personal versus employer objectives (balance) may be of lesser importance when venturing out with a new idea.

Our shortened 22-item version of the employability scale (Van der Heijde & Van der Heijden, 2006) did not predict (perceived) financial success, since the correlations with the employability dimensions appeared to be non-significant (for balance) and negative for all other four employability dimensions. This result can be interpreted in different ways. First, a possible explanation could be that employees scoring higher on employability are also more impatient with regard to an increase in their salary, resulting in lower scores on measures of satisfaction with financial rewards. Another explanation could be that employees who are more focused on their future career development and employability cannot be compared with employees who focus on financial progression in their careers; different individuals have various career drives, so to speak (see also the person-centered operationalization of employability by Fugate et al., 2004). Third, this outcome could be caused by the characteristics of the specific data set: Data set E comprised a rather hierarchical organization with a specific subculture (producer of building materials).

Furthermore, it might also be conceivable that an 'instrumental style of leadership' plays a role in explaining different results of the employability dimensions (Boerlijst, Van der Heijden, & Van Assen, 1993). More specifically, under circumstances of high employee career potential, it is in the supervisor's interest that the employee's expertise is utilized within the current framework of the department that he or she is heading, thus, restraining the employee from making promotion. After all, the 'here-and-now' functioning of subordinates determines the career success of the supervisor him or herself (Van der Heijden, 1998; Van der Heijden & Bakker, 2011).

Limitations of the Study and Recommendations for Further Research

Some limitations should be kept in mind when interpreting the results. First, all findings are based on cross-sectional, single-source data. Although we do think that it is unlikely that this

may have affected our results, we may only more safely conclude about this in case we perform future research testing our hypotheses using a longitudinal design. Research using multi-wave designs can provide more specific information about the stability and change with regard to the model variables, and about cross-lagged (i.e., over time) relationships compared with our cross-sectional approach (De Lange, Taris, Kompier, Houtman, & Bongers, 2004). Second, we have not conducted independent administrations to the same participants (see sin 4 ad mentioned by Smith et al., 2000). However, we believe that similar outcomes of independent submissions would plea for the stability of the factor structure across studies, given the fact that a bias due to recalling of scoring of the same items across the two instruments is herewith prevented. Third, even though several authors suggest the possible problem of common-method bias to be overestimated (e.g., Lindell & Whitney, 2001; Spector, 2006), as all data were collected via single-source surveys, there is a possibility of response set consistencies and common-method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Yet, in line with Podsakoff, Whiting, Welsh, and Mai (2013) who recommended on ways to tackle common-method variance, we used measures with a variety in labels for responses. Future research could also include other sources when evaluating workers' employability, for instance their direct supervisors or peers (see for instance Van der Heijden, Gorgievski, & De Lange, 2015). In addition, more work is needed to better understand the impact of workers' job level (see for instance Huang, Ryan, Zabel, & Palmer, 2014 who stressed that "job levels may afford differential opportunities to engage in more proactive forms of adaptive performance" (p. 166) on employability ratings, in particular for the dimensions of anticipation and optimization, and personal flexibility. Finally, more research is needed to better understand why the discriminant validity of the five employability dimensions is lower in case of using respondents that are engaged in virtual work (see the outcomes above regarding Data Set A). For now, given the fact that all of our previous work using the employability measurement instrument supported a second-order factor

structure (see for instance Van der Heijden et al., 2016), we strongly recommend differentiating between the five dimensions as this enables both scholars and practitioners to differentiate between strengths and weaknesses in individual performance, and therefore is of highly informative value for individual employability enhancement.

Practical Implications

This short and user-friendly 22-item valid and reliable version of the original 47-item employability instrument might be used for comparing competences of employees of different organizational units or departments and is also a sound basis for following up on an individual employee's development across the career span. The latter might produce an improvement in recruitment, staffing, and career mobility practices. In addition, given the increased opportunities to combine a larger set of variables, the short-form instrument enables HR practitioners to further investigate the relationship between individual, job-related and organizational career activities and characteristics, on the one hand, and employability, on the other hand (see for instance, Froehlich, Beausaert, Segers, & Gerken 2014; Froehlich, Beausaert, & Segers 2015). This might eventually lead to useful recommendations for enhancing life-long career success (Van der Heijden & De Vos, 2015).

In case working organizations apply psychometrically validated tools like the one that forms the core of our contribution, they have concrete starting-points to further enhance workers' employability by investing in those components that are relatively underdeveloped (see also Van der Heijden & Bakker, 2011). Enhancing workers' competences throughout their life-span and adjusting their workplaces and tasks will offer these workers significant potential within the labor market (see also Eden, 2014; Finch, Peacock, Levallet, & Foster, 2016; Rocco & Thijssen, 2006; Yeats, Folts, & Knapp, 2000; Zappalà, Depolo, Fraccoroli, Guglielmi, & Sarchielli, 2008), and is an important task for nowadays' management that, given the need for

dual responsibility for career development, should complement their workers' efforts to protect their life-long employability (Van der Heijden & De Vos, 2015).

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Appendix 1

Final Item Sets for the Short-form Employability Sub-Scales with Corresponding Item Numbers on page 475-476 in the article by Van der Heijde, C. M., & Van der Heijden, B. I. J. M. (2006). A competence-based and multidimensional operationalization and measurement of employability. *Human Resource Management*, *45*(3), 449-476.

Currently, two nominal identical versions of the instrument (self-report and supervisor version) are available in Dutch (being the original language of the items and scale anchors), English, German, Greek, Italian, Polish, and Norwegian (Van der Heijden et al., 2005). For all countries, the translation-back-translation method has been used (Hambleton, 1994), i.e. the measurement instrument has been translated from Dutch into the specific language and then back-translated to Dutch by an independent translator.

In line with Van der Heijden (2000), we argue that in order to provide a reliable and valid assessment using a competence-based instrument of employability, the rater needs to have access to a wide sample of behaviors under varying situations and periods of time (see also Jones & Nisbett, 1971). That is, the character of the items is retrospective.

Occupational Expertise

2. During the past year, I was, in general, competent to perform my work accurately and with few mistakes.
3. During the past year, I was, in general, competent to take prompt decisions with respect to my approach to work.
6. In general, I am competent to distinguish main issues from side issues and to set priorities.
9. I consider myself competent to weigh up and reason out the "pros" and "cons" of particular decisions on working methods, materials, and techniques in my job domain.
12. How would you rate the quality of your skills overall?

Anticipation and Optimization

1. How much time do you spend improving the knowledge and skills that will be of benefit to your work?
5. I consciously devote attention to applying my newly acquired knowledge and skills.
7. During the past year, I was actively engaged in investigating adjacent job areas to see where success could be achieved.
8. During the past year, I associated myself with the latest developments in my job domain.

Personal Flexibility

1. How easily would you say you can adapt to changes in your workplace?
3. I adapt to developments within my organization.
4. How quickly do you generally anticipate and take advantage of changes in your working environment?
6. How much variation is there in the range of duties you aim to achieve in your work?
7. I have a … (very negative-very positive) attitude to changes in my function.

Corporate Sense

3. I support the operational processes within my organization.
4. In my work, I take the initiative in sharing responsibilities with colleagues.
5. In my organization, I take part in forming a common vision of values and goals.
6. I share my experience and knowledge with others.

Balance

2. My work and private life are evenly balanced.
4. My work efforts are in proportion to what I get back in return (e.g., through primary and secondary conditions of employment, pleasure in work).
5. The time I spend on my work and career development on the one hand and my personal development and relaxation on the other are evenly balanced.
8. I achieve a balance in alternating between reaching my own work goals and supporting my colleagues.

Table 1. Characteristics of the Different Samples

	Data Set A	**Data Set B**	**Data Set C**	**Data Set D**	**Data Set E**
N (response rate %)	583 (7.6%)	354 (49.9%)	414 (66.9%)	487 (response rate not known)	314 (91.8%)
N organizations	Not known	1	37	151	1
% female	89.0%	48.9%	61.2%	40.5%	16.7%
Average age (SD)	46.36 (SD= 8.60)	46.24 (SD = 9.20)	37.70 (SD = 13.15)	38.00 (SD = 11.05)	40.90 (SD = 9.20)
Average tenure (SD)	12.16 years (SD = 8.79)	10.43 years (SD = 5.71)	9.49 (SD = 9.7)	7.43 (SD = 5.51)	10.52 (SD = 9.61)
% management job (supervisory tasks)	Not available	18.1%	19.6%	19.5%	56.1%
Educational level	low level 8.4%; secondary level: 32.8%; higher or academic level: 58.8%	low level 9.6%; secondary level 12.4%; higher or academic level 78%	low level 9.7%; secondary level35%; higher or academic level 55.3%	low level 0%; secondary level 67.8%; higher or academic level 32.2%	low level 0.9%; secondary level 79.7%; higher or academic level 19.4%
Permanent contract	Permanent 36.4%; Temporary contract at employer = 12.4% Self-employed= 38.4% Through Work Agency = 6.4 Other = 6.2	not available	65.5%	not available	not available
% part-time	75.8%	42.1%	60.4%	not available	not available

Table 2. Reliability in Terms of Cronbach's α across the Three Samples in the Test Phase

	Occupational expertise	**Anticipation & optimization**	**Personal flexibility**	**Corporate sense**	**Balance**
Data Set C	0.87	0.80	0.81	0.83	0.79
Data Set D	0.75	0.70	0.75	0.80	0.63
Data Set E	0.77	0.71	0.74	0.72	0.70

Table 3. Fit Indices across Two Samples for the Short-form Employability Sub-Scales in the Development Phase

	SBχ^2 (df = 198)	**RMSEA**	**P(RMSEA)**	**CFI**	**TLI**	**SRMR**	**$\Delta\chi^2\Delta$df (5)**
Data set A	460.829	0.048	0.692	0.937	0.927	0.052	57.550***
Data set B	368.071	0.049	0.952	0.920	0.906	0.055	5.531^{ns}

Legend:

SBχ^2 refers to Satorra Bentler χ^2 ML-based estimator.

Last column exhibits the difference between a five-dimensional solution and a second-order solution. The $\Delta\chi^2 = \chi^2$ (second order) - χ^2 (five dimensions).

*** $p < 0.001$.

Table 4. Means and Standard Errors of Original and Short-form Employability Sub-Scales in the Development Phase

	Data Set A		**Data Set B**	
	Full scales Mean (S E)	**Shortened scales Mean (S E)**	**Full scales Mean (S E)**	**Shortened scales Mean (S E)**
Occupational expertise	4.975 (0.022)	4.978 (0.026)	4.725 (0.028)	4.694 (0.031)
Anticipation & optimization	4.066 (0.036)	3.931 (0.043)	3.567 (0.039)	3.645 (0.042)
Personal flexibility	4.739 (0.026)	4.843 (0.025)	4.342 (0.029)	4.526 (0.029)
Corporate sense	4.138 (0.041)	4.138 (0.047)	3.750 (0.040)	3.841 (0.044)
Balance	4.012 (0.031)	3.920 (0.039)	4.103 (0.032)	4.055 (0.036)

Table 5. Fit indices of Confirmatory Factor Analysis of the Five Dimensions of Employability across Three Samples in the Test Phase

	SBχ^2(df =198)	**RMSEA**	**P(RMSEA)**	**CFI**	**TLI**	**SRMR**	**$\Delta\chi^2\Delta$df (5)**
Data set C	494.891	0.063	0.001	0.892	0.874	0.066	35.414***
Data set D	436.400	0.050	0.519	0.907	0.891	0.057	21.432***
Data set E	264.611	0.035	0.993	0.955	0.947	0.045	15.762*

Legend:

SBχ^2 refers to Satorra Bentler χ^2 ML-based estimator.

Last column exhibits the difference between a five-dimensional solution and a second-order solution. The $\Delta\chi^2 = \chi^2$ (second order) - χ^2 (five dimensions).

*** $p < 0.001$; * $p < 0.05$.

Table 6. Factor Loadings and Standard Errors Across the Three Samples in the Test Phase

	Data set C		**Data set D**		**Data set E**	
Items	**Factor loading**	**S E**	**Factor loading**	**S E**	**Factor loading**	**S E**
Occ. exp. 2	0.565	0.044	0.556	0.045	0.427	0.056
Occ. exp. 3	0.669	0.033	0.672	0.032	0.639	0.046
Occ. exp. 6	0.768	0.027	0.680	0.032	0.553	0.048
Occ. exp. 9	0.865	0.022	0.652	0.035	0.724	0.038
Occ. exp. 12	0.619	0.036	0.491	0.039	0.610	0.051
Ant. & opt. 1	0.672	0.034	0.475	0.047	0.578	0.053
Ant. & opt. 5	0.751	0.029	0.735	0.035	0.668	0.047
Ant. & opt. 5	0.704	0.031	0.540	0.040	0.565	0.052
Ant. & opt. 4	0.632	0.038	0.705	0.030	0.666	0.045
Pers. flex. 1	0.720	0.029	0.635	0.033	0.656	0.042
Pers. flex. 2	0.568	0.037	0.699	0.032	0.590	0.045
Pers. flex. 3	0.733	0.029	0.744	0.028	0.728	0.038
Pers. flex 4	0.624	0.038	0.477	0.041	0.541	0.045
Pers. flex 5	0.577	0.038	0.538	0.043	0.575	0.047
Corp. sense 1	0.620	0.044	0.633	0.036	0.619	0.050
Corp. sense 2	0.819	0.024	0.672	0.041	0.720	0.036
Corp. sense 3	0.768	0.027	0.663	0.036	0.735	0.034
Corp. sense 4	0.682	0.033	0.555	0.039	0.737	0.033
Balance 1	0.607	0.035	0.731	0.036	0.542	0.069
Balance 2	0.603	0.041	0.446	0.049	0.454	0.074

Balance 3	0.708	0.042	0.754	0.031	0.890	0.077
Balance 4	0.727	0.035	0.550	0.039	0.342	0.067

Table 7. Pearson's *r* Correlations with Original Sub-Scales across Two Samples

	Occupational expertise	**Anticipation & optimization**	**Personal flexibility**	**Corporate sense**	**Balance**
Data set D	0.92**	0.93**	0.93**	0.93**	0.92**
Data set E	0.93**	0.90**	0.93**	0.94**	0.92**

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Table 8. Means and Standard Errors of Original and Short-Form Sub-Scales in the Test Phase

	Data set D		**Data set E**	
	Original scales	**Short-form sub- scales**	**Original scales**	**Short-form sub-scales**
	Mean (S E)	**Mean (S E)**	**Mean (S E)**	**Mean (S E)**
Occupational expertise	4.683 (0.022)	4.623 (0.024)	4.783 (0.024)	4.721 (0.027)
Anticipation & optimization	3.903 (0.031)	4.00 (0.032)	3.720 (0.037)	3.559 (0.043)
Personal flexibility	4.461 (0.023)	4.658 (0.024)	4.441 (0.028)	4.611 (0.028)
Corporate sense	4.107 (0.030)	4.126 (0.034)	4.134 (0.041)	4.200 (0.046)
Balance	4.270 (0.030)	4.195 (0.030)	4.297 (0.029)	4.149 (0.033)

Table 9. Predictive Validity for the Three Samples in the Test Phase

	Occupational expertise	**Anticipation optimization**	**Personal flexibility**	**Corporate sense**	**Balance**
Affective commitment (Data Set C)	0.298***	0.368***	0.294***	0.512***	0.282***
Individual performance (Data Set C)	0.681***	0.315***	0.410***	0.356***	0.219***
Innovative work behavior (Data Set D)					
Idea Generation	.043	.162**	.138**	.133**	.013
Idea Promotion	- .001	.180**	.132**	.120**	.036
Idea Realization	.040	.170**	.114*	.101*	.035
Job satisfaction (Data Set E)	0.189**	0.247***	0.162**	0.336***	0.175**
Interpersonal success (Data Set E)	0.322***	0.186**	0.270***	0.291***	0.249***
Financial success (Data Set E)	-0.134*	-0.205**	-0.140*	-0.166**	0.021
Hierarchical success (Data Set E)	0.130*	0.310***	0.242***	0.323***	0.169**
Life satisfaction (Data Set E)	0.288***	0.218***	0.251***	0.303***	0.132*

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Table 10. Validity and Reliability: An overview Across the Development and Test Phase Samples

	Data Set				
	A	**B**	**C**	**D**	**E**
1. Construct Validity					
a) Factorial validity	X	X	X	X	X
b) Content validity (original and short-form scales)	X	X		X	X
c) Precision	X	X	X	X	X
2. Predictive Validity			X	X	X
3. Reliability	X	X	X	X	X

Highlights

- Employability refers to a permanent acquisition and fulfillment of employment
- Five-dimensional operationalization of employability with good discriminant validity
- The 22-item short-form instrument facilitates scientific HRM and career research